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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/727,818

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Timothy E. Herod

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EXAMINER

DANIELS, MATTHEW J

ART UNIT

PAPER NUMBER

1732

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/727,818	HEROD ET AL.	
	Examiner	Art Unit	
	Matthew J. Daniels	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. **Claims 1, 12, 15, 17-23, 25-29** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatchadoorian (USPN 4526831) in view of Murley (USPN 4536148).

**As to Claim 1**, Hatchadoorian teaches a method for thermoforming a thin thermoplastic carrier (13:55-56) which would implicitly have uniformity of thickness and optical quality (8:14-20, biaxial expansion would produce a substantially uniform thickness) comprising the steps of:

locating a sheet on a vented platform equipped with a mold insert and clamping the thermoformer platens (6:15-17, Fig. 3, Fig. 4);

confining a low pressure air stream within a shroud having a geometry matched to the mold insert's periphery (Fig. 4, everything between items 16 is interpreted to be the shroud), the low pressure air stream thermoforming the plastic sheet (7:15 and elsewhere); and

Hatchadoorian is silent to the deflecting of the air stream in a path leading to the mold insert. However, Murley teaches that it is known to provide deflection of an air stream in a path leading to the mold insert (Fig. 5, deflected through ports, 84). It would have been prima facie obvious to one of ordinary skill in the art at the time of the

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invention to incorporate the method of Murley into that of Hatchadoorian in order to avoid non-uniform cooling of the part during the blowing process. **As to Claim 12**, Hatchadoorian teaches the claimed thickness (2:2) and it is submitted that the sheet is heated to its glass transition temperature (3:3, 3:27). **As to Claim 15**, 200 kPa (Hatchadoorian, 2:7) is a pressure of about 29.1 psi. **As to Claims 17-23**, Hatchadoorian teaches a shroud (8) which has an open end facing the vented platform (9), having the same geometry as the insert (13), a uniform cross-sectional shape along its height, with the shroud having being cylindrical and having a radius larger than the mold insert (Fig. 4), but having a substantially similar size, with vents located between the radius of the insert and the shroud (23). **As to Claims 25-27**, Hatchadoorian provides all paths from the inlet to the insert making a cone, but is silent to the deflector. However, Murley teaches a deflector (Fig. 6, item 80) which would function as a baffle or plate, and is installed into the inlet of the top shroud of Murley. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Murley into that of Hatchadoorian in order to avoid non-uniform cooling of the part during the blowing process. **As to Claim 28**, Hatchadoorian provides a spherical mold plate (5:62). **As to Claim 29**, the distance between insert and shroud is substantially equal and symmetrical in view of the round configuration (5:64).

2. **Claims 2, 6, and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatchadoorian (USPN 4526831) in view of Murley (USPN 4536148) and further in view of Niebling (USPN 5108530) and Cruckshank (USPN 3753830). Hatchadoorian and Murley teach the subject matter of Claim 1 above under 35 USC 103(a). **As to**

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**Claim 2**, Hatchadoorian is silent to the heating medium through the vented platform and through circulating channels within a sub-platform spaced from the vented platform to form a gap therebetween which communicates with the vents. However, Niebling teaches passing a heating medium through the platform (Fig. 1, item 19), and Cruckshank teaches passing heating medium through circulating channels within a sub-platform (Fig. 3, item 94) spaced from the vented platform (Fig. 3, Item 86) to form a gap therebetween (Fig. 3, Item 84) which communicates with the vents (Fig. 3, item 86). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the methods of Niebling and Cruckshank into that of Hatchadoorian in order to maintain the mold temperature at the desired level and to provide more uniform heat distribution. **As to Claim 6**, Hatchadoorian provides a mold insert with a base member (13), installing through the vented platform (9) and into a receiving port (23) below the platform, and providing a configuration where the mold insert lies approximately even with the contour of the vented platform surface (dotted line shows contour of 13 and it follows the contour from item 29). **As to Claim 7**, Hatchadoorian is silent to the claimed cooling medium, channels within the support platform, and sandwiching an insulating plate. However, Cruckshank teaches a circulating a cooling medium through channels within a support platform (horizontal portion of 90c in Fig. 3), and sandwiching an insulating plate (the plate above 80c and 90c). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Cruckshank into that of Hatchadoorian in order to supply coolant to the heating and cooling manifold and to support the mold.

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3. **Claims 3-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatchadoorian (USPN 4526831) in view of Murley (USPN 4536148), Niebling (USPN 5108530) and Cruckshank (USPN 3753830), and further in view of Fortin (USPN 5683648). Hatchadoorian, Murley, Niebling, and Cruckshank teach the subject matter of Claim 2 above under 35 USC 103(a). **As to Claim 3**, Hatchadoorian teaches a PET material (1:59), but is silent to the particular forming temperatures. However, Fortin teaches PET material (9:40-45) and suggests that the sheet reach a temperature of 70 C, or 158 F (9:40-42). Although silent to the particular heating medium temperature, when combined with Niebling and Cruckshank, it would have been prima facie obvious to provide a heating medium temperature substantially the same as the desired mold temperature. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Fortin into that of Hatchadoorian in order to provide orientation of the sheet and in view of Fortin's teaching that this is a desirable thermoforming temperature for the polymeric material of Hatchadoorian. **As to Claims 4 and 5**, Hatchadoorian is silent to the particular temperatures for preheating. However, Fortin teaches that the particular temperature to which the platform is heated and the heated air stream should be selected so as to be equal to the orientation temperature of the thermoplastic material (9:38-40 and 18:26-34). Therefore, the particular temperatures of the platform and air stream are result effective variables in order to produce the desirable orientation. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Fortin into that of Hatchadoorian because Hatchadoorian suggests preheating in the thermoforming mold (6:15-17), which Fortin provides.

4. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatchadoorian (USPN 4526831) in view of Murley (USPN 4536148) and further in view of Enlow (USPN 5686186) and Edwards (USPN 3342914). Hatchadoorian and Murley teach the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 8**, it is submitted that Hatchadoorian teaches heating the sheet to at least its glass transition temperature, but is silent to the removing of the protective sheet and the sled, which is interpreted to be a restraining frame. However, Enlow teaches removal of a carrier sheet before thermoforming (13:67-14:4) and Edwards teaches a restraining frame (Fig. 1, Items 14 and 16). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the methods of Enlow and Edwards into that of Hatchadoorian in order to protect the sheet until thermoforming or to use a carrier sheet to assist in fabricating the sheet to be thermoformed (Enlow) and to help avoid wrinkling by restraining the sheet (Edwards).

5. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatchadoorian (USPN 4526831) in view of Murley (USPN 4536148), Enlow (USPN 5686186) and Edwards (USPN 3342914), and further in view of Dastoli (USPN 4880581). Hatchadoorian, Murley, Enlow, and Edwards teach the subject matter of Claim 8 above under 35 USC 103(a). **As to Claim 9**, Hatchadoorian is silent to the HEPA airflow environment. However, Dastoli teaches that a HEPA airflow environment is desirable for any plastic manufacturing process employing high temperature and pressure (6:30-42, 4:15). It would have been prima facie obvious to one of ordinary skill

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in the art at the time of the invention to incorporate the method of Dastoli into that of Hatchadoorian in order to provide a product which is ready for shipment, which is sterile both interiorally and exteriorally (6:20-29).

6. **Claims 10 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatchadoorian (USPN 4526831) in view of Murley (USPN 4536148), Enlow (USPN 5686186), Edwards (USPN 3342914), Dastoli (USPN 4880581), and further in view of Bonkowski (USPN 5237796). Hatchadoorian, Murley, Enlow, Edwards, and Dastoli teach the subject matter of Claim 9 above under 35 USC 103(a). **As to Claims 10 and 11**, Hatchadoorian teaches heating to a temperature of 100 C (212 F) (6:14), but is silent to the IR heating of the sheet. However, Bonkowski teaches that it is known to provide an infrared source operating at 3 to 14 microns (5:35), overlapping the PET absorption bands (4:3-15) in order to heat the sheet prior to thermoforming. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Bonkowski into that of Hatchadoorian in order to rapidly heat the sheet using infrared energy overlapping the absorption bands of Hatchadoorian's PET material.

7. **Claims 13, 14, and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatchadoorian (USPN 4526831) in view of Murley (USPN 4536148) and further in view of Hall (USPN 5649438). Hatchadoorian and Murley teach the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 13**, Hatchadoorian is silent to the clamping pressure. However, the claimed clamping pressure is a conventional clamping



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pressure and is taught by Hall (12:22-32). Furthermore, Hall teaches clamping pressure and pneumatic pressure to be result effective variables which should be optimized in order to avoid wrinkling (11:11-36). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Hall into that of Hatchadoorian in order to avoid wrinkling. **As to Claim 14**, Hall suggests the claimed process conditions be determined by optimization. Thus, one optimizing the process of Hatchadoorian would have obviously arrived at the same process conditions. Also see Hall's teaching of values for pneumatic ( $F_p$ ) and clamping ( $F_c$ ) in Fig. 4, which may be calculated from the graph by the presence of the y-axis hash marks. **As to Claim 16**, Hall teaches that the clamping and pneumatic pressures are result effective variables (11:11-36), leading to the claimed values.

8. **Claim 24** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatchadoorian (USPN 4526831) in view of Murley (USPN 4536148) and further in view of Edwards (USPN 3172159). Hatchadoorian and Murley teach the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 24**, Hatchadoorian is silent to simultaneously thermoforming multiple carriers. However, Edwards teaches that it is known to locate a heated sheet on a platform with multiple mold inserts (Figs. 2 and 3), each having a geometry-matching shroud for the insert (Fig. 5, item 156 and 216), and deflecting the air stream (Fig. 5, items 164 and 184). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Edwards into that of Hatchadoorian because it would have been obviously

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desirable to shape multiple articles at once so as to improve the efficiency by increasing the scale of the process.

9. **Claim 30** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatchadoorian (USPN 4526831) in view of Murley (USPN 4536148), and further in view of Fortin (USPN 5683648). Hatchadoorian and Murley teach the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 30**, Hatchadoorian teaches unclamping the platens and annealing (11:46-48), but is silent to the claimed annealing conditions. However, Fortin anneals a substantially similar polymer material (PET) for about 5 minutes (18:54-59). Fortin teaches that many temperatures can be used, preferably within 75 degrees C of the melt temperature, but for PET, 120 – 250 degrees C is sufficient (14:40-60). Fortin's 120 degrees C is equivalent to 248 degrees F. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Fortin into that of Hatchadoorian in order to improve the strength of the resulting article by annealing a higher level of crystallinity, as suggested by Hatchadoorian (11:46-48, for example).

#### ***Response to Arguments***

10. Applicant's arguments, see pages 8-9 of the remarks, filed 2 March 2007, with respect to the rejection(s) of claim 1 under 35 USC 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made over Hatchadoorian in view of Murley.

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11. The rejection has been withdrawn in view of the nonuniform thickness and unoriented portion shown by Fortin in Fig. 26. It is noted that arguments with regard to the "optical" quality are not commensurate with the scope of the claims as amended. It is submitted that the sheet of Hatchadoorian would provide optical quality due to its smoothness (8:14-20) and in view of the fact that Hatchadoorian's sheet is PET (5:49) and contains a minimal amount of reinforcement (13:58), which would not destroy its "optical" quality in transmission.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Matthew J. Daniels

A.U. 1732  
29 May 2007